इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 15773 (2008): Sodium dichloroisocyanurate [PCD 9: Organic Chemicals Alcohols and Allied Products and Dye Intermediates]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

भारतीय मानक

सोडियम डाईक्लोरोआइसोस्यूनरेट — विशिष्टि

Indian Standard

SODIUM DICHLOROISOCYANURATE — SPECIFICATION

ICS 71.100.80

© BIS 2008

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 2008

Price Group 5

Organic Chemicals, Alcohols and Allied Products and Dye Intermediate Sectional Committee, PCD 9

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Organic Chemicals, Alcohols and Allied Products and Dye Intermediate Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Organic chloramines, sodium dichloroisocyanurate is widely used as a disinfectant, industrial deodorants, textile bleaches, purification of water, hospitals, railways, public sanitation places, etc. The material also finds its usage in many laboratories for disinfection of equipment, in dairy cattle and poultry farms, and aqua culture farms. The products like feeding bottle, nappy clothes, bed spreads, feeding spoons, etc, requiring disinfection can also use it. It has a very broad spectrum of disinfections against bacteria and other harmful pathogens. Chlorine produced is used for disinfect municipal water for public supply, hospitals, railways, swimming pools, etc, in various ways.

This is an effective disinfectant and produces hypochlorous acid (HOCl) directly on dissolving in water. It is advantageous because of its better shelf-life, efficient release of available chlorine and stability in water. Besides, being less corrosive, the compound dissolves with effervescence leaving no residue and hence no sludge is formed.

This compound is also used for effluent treatment purpose, but each time an effluent is let out in rivers or ponds, it has to be tested for chlorine content in it. Since all chlorine compounds are dangerous to aquatic organisms, the chlorine (free chlorine) content in the effluent has to be nullified by various processes like long storage, aeration, etc, before letting out the effluent. Normally this can be avoided by treating the effluent to the break point chlorination. It also finds use for sewage treatment.

This standard however, prescribes the requirements and methods of sampling and test for sodium dichloroisocyanurate (NaDCC) meant for treatment of water intended for human consumption. Its manufacture in the country would substitute import.

Considerable assistance has been derived from European Standard EN 12931 : 2000 'Sodium dichloroisocyanurate, anhydrous', and IS 12932 : 2000 'Sodium dichloroisocyanurate, dihydrate' in the formulation of this standard. In respect of potential adverse effects on the quality of water intended for human consumption, caused by this product, any restrictions laid down by the Food and Drugs Authorities for its usage should be followed. Two informative annexes (*see* Annexes F and G) have been given for guidance purpose.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SODIUM DICHLOROISOCYANURATE — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for sodium dichloroisocyanurate (NaDCC) meant for treatment of water intended for human consumption.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated at Annex A.

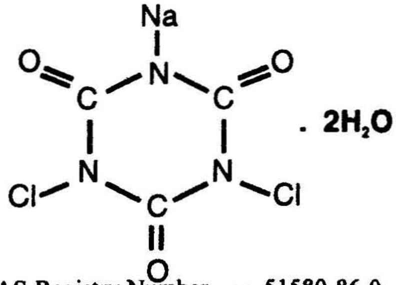
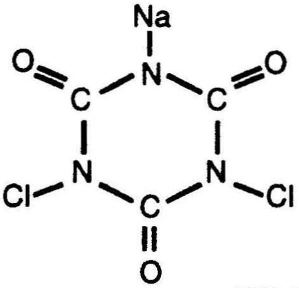
3 TYPES

This standard covers sodium dichloroisocyanurate, dihydrate as Type 1 and sodium dichloroisocyanurate, anhydrous as Type 2.

4 REQUIREMENTS

4.1 Identification

The material is organic chloramines, organic compound with amine having one, two or three chlorine atoms attached to it (Chloramine) as the functional group.

Characteristic	*Sodium Dichloroisocyanurate, Dihydrate (Type 1)*	*Sodium Dichloroisocyanurate, Anhydrous (Type 2)*
Chemical name	1-sodium – 3,5 – dichloro – 1,3,5-triazine – 2,4,6-trione dihydrate	1-sodium – 3,5 – dichloro – 1,3,5-triazine – 2,4,6-trione
Molecular mass	256.02	219.98
Empirical formula	$C_3N_3O_3Cl_2Na.2H_2O$	$C_3N_3O_3Cl_2Na$
*p*H of 1 percent solution	6.0-7.0	6.0 - 7.0
Commercial form	Available in various granular forms	Available in various granular forms
Chemical formula		
CAS Registry Number	— 51580-86-0	2893-78-9
EPA Registration No.	— 935-36	935-38

4.2 Description and Physical Properties

Physical Properties	*Sodium Dichloroisocyanurate, Dihydrate*	*Sodium Dichloroisocyanurate, Anhydrous*
Appearance and odour	The product is white granular solid with chlorinous odour	The product is white granular solid with chlorinous odour
Density	The bulk density is approximately 0.9 g/cm^3	The bulk density is approximately 0.9 g/cm^3
Solubility in water	291 g/l at 25°C	250 g/l at 25°C

4.3 Chemical Properties

Chemical Properties	*Sodium Dichloroisocyanurate, Dihydrate*	*Sodium Dichloroisocyanurate, Anhydrous*
Hydrolysis	The product is strong oxidant. Sodium dichloroisocyanurate decomposes into hydrochloric acid and cyanuric acid. It librates chlorine by hydrolysis	The product is a strong oxidant. It is corrosive and hygroscopic. Sodium dichloroisocyanurate decomposes into hydrochloric acid and cyanuric acid. When dissolved in excess of water it liberates chlorine by hydrolysis
Composition	The product shall contain at least 55 percent by mass (percent, *m*/*m*) of available chlorine. The procedure for determination of available chlorine is given in Annex B	The product shall contain at least 62 percent by mass (percent, *m*/*m*) of available chlorine. The procedure for determination of available chlorine is given in Annex B
Impurities and main by-products	The sodium chloride content shall be less than 0.05 percent by mass (*m*/*m*) of the product when tested as per procedure given in Annex D	The water content shall be less than 3 percent (*m*/*m*) of the product when tested as per procedure given in Annex C and sodium chloride content shall be less than 0.05 percent by mass (*m*/*m*) of the product when tested as per procedure given in Annex D
Toxic substances	Limits of impurities and toxic substances which are likely to be present in significant quantities from the current production process and raw materials are given in Table 1. The content of toxic substances shall conform to the requirements specified in Table 1.	Limits of impurities and toxic substances which are likely to be present in significant quantities from the current production process and raw materials are given in Table 1. The content of toxic substances shall conform to the requirements specified in Table 1

Table 1 Toxic Substances

(*Clause* 4.3)

Sl No. (1)	Element (2)	Limit in PPM, mg/kg of Product (3)	Method of Test, Ref to (4)
i)	Arsenic (As), *Max*	0.05	IS 3025 (Part 37)
ii)	Cadmium (Cd), *Max*	0.01	IS 3025 (Part 41)
iii)	Chromium (Cr), *Max*	0.05	Annex J of IS 13428
iv)	Mercury (Hg), *Max*	0.001	IS 3025 (Part 48)
v)	Nickel (Ni), *Max*	0.02	Annex L of IS 13428
vi)	Lead (Pb), *Max*	0.01	IS 3025 (Part 47)
vii)	Antimony (Sb), *Max*	0.005	Annex G of IS 13428 or IS 15303[1]
viii)	Selenium (Se), *Max*	0.01	IS 3025 (Part 56) or IS 15303[1]

NOTES

1 Cyanide which does not exist in a strong oxidizing medium such as sodium dichloroisocyanurate is not a relevant toxic substance. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process.

2 If a change in the production process or raw materials leads to significant quantities of other impurities or by-products being present, this shall be notified to the user.

3 In case of dispute, the method indicated by '[1]' shall be the reference method.

5 SAMPLING

Representative samples of the material shall be drawn and their conformity to this standard shall be determined in accordance with the method prescribed in Annex E.

6 SAFETY PRECAUTIONS AND HAZARDS

Some of the basic hazards and precautions related to this material are mentioned in Table 2 for guidance.

7 PACKING AND MARKING

7.1 Packing

The granular/powder material shall be packed in an air-tight plastic drum.

7.2 Storing

The material shall be stored in shade, at room temperature away form source of heat and moisture.

7.2.1 *Storage Incompatibilities*

Store the product on its own. Keep it away from:

a) water;
b) nitrogenated products;
c) organic solvents;
d) hydrocarbons;
e) peroxides;
f) hypochlorites; and
g) oils, greases and organic materials.

7.3 Marking

The containers shall be securely closed and marked with the following information:

a) Name of the material,
b) Net mass,
c) Month and year of packing,
d) Indication of the source of manufacture,
e) Batch number to enable the lot of manufacture to be traced from records, and
f) Expiry date.

7.3.1 A leaflet containing instruction for use shall be enclosed. Besides, information on nature of special risks attributed to dangerous substances may be provided such as:

a) Contact with combustible material may cause fire;
b) Harmful, if swallowed;
c) Contact with acids liberates toxic gas;
d) Irritating to eyes and respiratory system;
e) Keep container dry;
f) In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; and
g) In case of fire and/or explosion do not breathe fumes.

7.3.2 *BIS Certification Marking*

The packages may also be marked with the Standard Mark.

7.3.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

Table 2 Hazards/Prevention Measure for Use of Material

(*Clause* 6)

Sl No. (1)	Type of Hazards (2)	Acute Hazards/Prevention (3)
i)	Fire	Not combustible, contact with combustible material may cause fire. Keep away from moisture and light
ii)	Physical contacts (eye contact, skin, inhalation)	Cough, sore throat, redness and irritating to eyes and respiratory system. Use face mask, protective gloves, protective clothing, eye glasses, etc, while using the material
iii)	Ingestion	Harmful if swallowed, burning sensation, sore throat. Drinking, eating, and smoking during handling the material is prohibited
iv)	Spillage	Air-tight containers, to avoid spillage during transport, not to be transported with food and feedstuffs. Keep spilled material dry. Sweep, scoop, or vacuum the spilled materials and place in clean, dry containers for disposal
v)	Contact with acid	Liberates toxic gas

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
695 : 1976	Specification for acetic acid (*third revision*)
1070 : 1992	Reagent grade water (*third revision*)
3025	Methods of sampling and test (physical and chemical) for water and waste water:
(Part 37) : 1988	Arsenic (*first revision*)
(Part 41) : 1992	Cadmium (*first revision*)
(Part 47) : 1994	Zinc (*first revision*)
(Part 48) : 1994	Mercury (*first revision*)
(Part 56) : 2003	Selenium (*first revision*)
4905 : 1968	Methods for random sampling
7163 : 1989	Potassium iodide, pure and analytical reagent (*first revision*)
13428 : 1998	Packaged natural mineral water — Specification (*first revision*)
15303 : 2003	Determination of antimony iron and selenium in water by electrothermal atomic absorption spectrometric method

ANNEX B

(*Clauses* 4.3 *and* E-4)

DETERMINATION OF AVAILABLE CHLORINE

B-1 PRINCIPLE

The available chlorine is determined by measuring active chlorine in the sample. The oxidizing chlorine reacts with potassium iodide releasing iodine, which is then titrated with sodium thiosulfate standard volumetric solution in the presence of starch indicator solution.

B-1.1 Reagents

All reagents shall be of analytical grade.

B-1.1.1 *Potassium Iodide Crystals* (KI), See IS 7163.

B-1.1.2 *Glacial Acetic Acid,* See IS 695.

B-1.1.3 *Sodium Thiosulfate Standard Volumetric Solution* ($Na_2S_2O_3.5H_2O$) = 0.1 mol/l

Dissolve 24.8 g of $Na_2S_2O_3.5H_2O$ with water. Add 0.5 ml of chloroform as preservative. Dilute to volume with water in a 1 000-ml one-mark volumetric flask and mix thoroughly. To standardize it, weigh, to the nearest 0.1 mg [160 ± 10 mg(m)] of primary standard potassium dichromate into a tared glass beaker. Place the contents of the beaker in a 500-ml stoppered conical flask, add 100 ml of water and 2 ± 0.5 of potassium iodide and stir to dissolve. Add 15 ± 1 ml of hydrochloric acid solution (diluted 1 + 1 by volume) swirl and allow to stand for 5 min. Titrate with the sodium thiosulfate solution until the solution is pale yellow. Add 5 ± 1 ml of starch solution and titrate to the end point that is to the disappearance of the blue-black colour. Record the volume (v) used.

The concentration, c, of the sodium thiosulfate standard volumetric solution ($Na_2S_2O_3.5H_2O$), expressed in moles per litre is given by the following equation:

$$c = \frac{m}{V \times 49.031\,7}$$

where

m = mass, of potassium dichromate ($K_2Cr_2O_7$) weighed, in mg; and

V = volume, of the sodium thiosulfate standard volumetric solution used, in ml.

49.031 7 is the molar mass, in g/mole of potassium dichromate.

B-1.1.4 *Starch Solution,* 1 *Percent* (*m*/*m*) — Make a slurry with 1 ± 0.1 g/mole starch and 5 ± 1 ml water. Add 90 ± 5 ml boiling water to the slurry. Stir to dissolve it and cool the solution. This solution needs refrigeration to avoid the decomposition of the starch, which results in a vague end point. Keep the solution cool and use it within one week.

B-2 PROCEDURE

Weigh to the nearest 0.1 mg, 0.25 g of the sample (m_o) into a tared stoppered weighing bottle. Transfer the material to a 200-ml volumetric flask. Add 10 ml of water and 10 ml of glacial acetic acid, stir for 5 min and then add 100 ml of water and 2 g of potassium iodide, mix to dissolve and wait for 10 min. Titrate with the sodium thiosulfate standard volumetric solution to a light yellow colour. Add 5 ml of the starch solution and continue titration to the disappearance of the blue black colour. Record the volume (V_1) of the sodium thiosulfate standard volumetric solution used.

B-3 CALCULATION

The chlorine (Cl_2) content, C_1, expressed as a percentage by mass (percent, *m*/*m*), is given by the following equation:

$$C_1 = \frac{V_1 \times 0.003\,545 \times c}{m_o} \times 100$$

where

V_1 = volume of the sodium thiosulfate solution used for the titration, in ml; and

m_o = mass of the test portion, in g; and

c = actual concentration, expressed in mole/litre of the sodium thiosulfate standard volumetric solution.

ANNEX C

(*Clauses* 4.3 *and* E-4)

DETERMINATION OF MOISTURE

C-1 PROCEDURE

Weigh accurately 10 g of the material in a glass evaporating dish (diameter 150 mm), and place it for 4 h in ventilated oven made of aluminum, provided with a means of circulating the air inside, at 105°C. Allow to cool in a desiccator and weigh the glass dish again. The decrease in mass corresponds to the moisture content of the material.

C-2 CALCULATION

$$\text{Moisture content, percent by mass} = \frac{M_1 - M_2}{M_2} \times 100$$

where

M_1 = mass of the material taken before drying, in g; and

M_2 = mass of the material after drying, in g.

ANNEX D

(*Clauses* 4.3 *and* E-4)

DETERMINATION OF SODIUM CHLORIDE

D-1 GENERAL

This method applies to products with sodium chloride contents in the range of 0 percent (*m*/*m*) to 0.05 percent (*m*/*m*).

D-1.1 Principle

The anhydrous sodium dichloroisocyanurate is acidified and then digested to remove all traces of available chlorine. Sodium is analyzed in solution by atomic absorption spectrometry.

D-1.2 Reagents

All reagents shall be a recognized analytical grade.

D-1.2.1 *Sulphuric Acid Concentrated* (H_2SO_4) — 95 percent (*m*/*m*), *Min.*

D-1.2.2 *Sodium Standard Stock Solution c(Na)/* 1 000 µg/ml — Weigh 2.542 1 g of sodium chloride that has been previously dried for 1 h at 110°C. Dissolve with water and dilute to volume with water in a 1 000-ml one-mark volumetric flask. Mix well.

D-1.2.3 *Apparatus*

Ordinary laboratory apparatus and glassware, together with the following:

a) Atomic absorption spectrometer equipped with sodium hollow cathode lamp, and

b) Hot plates.

D-1.2.4 *Procedure*

Weigh, to the nearest 0.1 mg, 2.5 g of the laboratory sample (m_3) into a tared stoppered weighing bottle. Transfer the test portion to a 250-ml beaker. Dilute with 25 ml of water. Mix and then add 10 ml of the concentrated sulfuric acid and place on a hot plate and boil until the salt begins to precipitate. Rinse the inside of the beaker with water.

Transfer to a 250-ml volumetric flask and dilute to the mark with water and mix well.

Measure the absorbance of the solution on the atomic absorption spectrometer with sodium hollow cathode lamp at a wavelength of 330.2 nm with slit setting at '4' using an air-acetylene flame.

D-1.2.5 *Calibration*

Transfer accurately from the sodium standard solutions, 1.0 ml, 2.0 ml, 3.0 ml, 4.0 ml, 5.0 ml and 10.0 ml portions to a series of 100-ml volumetric flasks, dilute each to the mark with water and mix well. Prepare a calibration blank.

Measure the absorbance of each calibration solution as described above and prepare a calibration graph.

D-1.2.6 *Expression of Results*

The sodium chloride content (C_1), expressed as a percentage by mass, percent (*m*/*m*) of product is given by the following equation:

$$C_1 = \frac{c \times 100 \times 20 \times 2.542\ 1}{M_1 \times 10\ 000}$$

where

M_1 = mass of the test portion, in g; and

c = concentration of sodium in the test portion as determined from the calibration graph, in µg/ml.

ANNEX E

(*Clause* 5)

SAMPLING OF SODIUM DICHLOROISOCYANURATE

E-1 GENERAL REQUIREMENTS OF SAMPLING

E-1.1 In drawing, preparing, storing and handling test samples, the following precaution and directions shall be observed.

E-1.1.1 Samples shall not be exposed to the atmosphere for a longer time than necessary, and sampling shall be done as rapidly and as thoroughly as possible.

E-1.1.2 Samples shall be placed in cool and dry place.

E-1.1.3 The sample containers shall be of such a size that they are nearly filled by the samples.

E-1.1.4 Each sample container so filled shall be sealed air-tight after filling, and marked with full details of sampling, the date of sampling, the month and year of manufacture of the material and its size.

E-1.1.5 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination. Care shall be taken to avoid direct contact of the material with the skin. Face should be kept at a distance from the container when it is opened.

E-1.1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal room temperature.

E-2 SCALE OF SAMPLING

E-2.1 Lot

All the containers in a single consignment of same size of the material drawn from a single batch of manufacture shall constitute the lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

E-2.2 The number of containers (*n*) to be selected from the lot shall depend upon the size of the (*N*) and shall be in accordance with Table 3.

E-2.3 These containers shall be selected at random from the lot and in order to ensure randomness of selection, random number tables may be used. In case, such tables are not available, the following procedure may be adopted:

Starting from any container, count them in the order 1, 2, 3,... up to *r*, where *r* is the integral part of *N*/*n*. Every *r*th container thus counted shall be withdrawn to constitute the sample.

E-3 PREPARATION OF SAMPLES

E-3.1 Empty out the containers selected in **E-2** in a plastics bag/ bottle and mix thoroughly. In case the quantity so collected exceeds 1.5kg, reduce it by coning and quartering.

E-3.2 Divide the sample collected/reduced in **E-3.1** into three equal parts, each of which shall be called a composite sample to represent the lot.

E-3.3 Immediately transfer each of the three composite samples obtained in **E-3.2** to an appropriate glass/ plastics container, which shall be sealed air-tight and marked with necessary details for identification.

E-3.4 One of the three composite samples shall be marked for the purchaser, another for the supplier, and the third kept as a referee sample.

E-3.5 The referee sample shall be kept at a place and under conditions agree to between the purchaser and the supplier. The referee sample shall be used in case of dispute.

E-4 CRITERIA FOR CONFORMITY

The material in any lot shall be accepted as conforming to the requirements of this standard if this composite sample meets the requirements given in **3** and **4**, when tested as per the procedure laid down in Annexes B, C and D.

Table 3 Number of Containers to be Selected

(*Clause* E-2.2)

Sl No. (1)	Lot Size *N* (2)	Sample Size *n* (3)
i)	2-8	2
ii)	9-27	3
iii)	28-64	4
iv)	65-125	5
v)	126-216	6
vi)	217-343	7
vii)	344-512	8

ANNEX F

(*Foreword*)

GENERAL INFORMATION ON SODIUM DICHLOROISOCYANURATE

F-1 ORIGIN

F-1.1 Raw Materials

Sodium dichloroisocyanurate is manufactured from isocyanuric acid $(CNOH)_3$, Sodium hydroxide (NaOH), and chlorine (Cl_2).

F-1.2 Manufacturing Process

Sodium dichloroisocyanurate is produced by chlorination of disodium cyanurate $[Na_2H(NCO)_3]$ using chlorine (Cl_2) and neutralization with sodium hydroxide (NaOH).

Disodium cyanurate is obtained by action of sodium hydroxide on isocyanuric acid.

F-2 USE

F-2.1 Function

The product is a water treatment chemical for emergency use, used as disinfectant by generation of hypochlorous acid through hydrolysis:

$$C_3N_3O_3Cl_2Na + 2H_2O \rightarrow C_3N_3O_3H_2Na + 2HOCl$$

F-2.2 Form in Which It is Used

The product is used in solution up to approximately 1 percent (*m*/*m*) in water.

F-2.3 Treatment Dose

Subject to local regulations, depending on the quality of the water to be treated, usually the concentration of active chlorine should not exceed a few tenths of mg/l.

F-2.4 Means of Application

Pre-dissolution and automatic feeding using metering pumps.

F-2.5 Secondary Effects

The secondary effects include the following:

a) Oxidation of iron, of manganese and ammonium compounds;

b) Slight increase of Kjeldahl nitrogen;

c) Slight increase in the chloride content;

d) Odour and colour removal; and

e) Oxidation of organic compounds.

F-2.6 Removal of Excess Product

Removal by using an aqueous solution of sodium sulfite or sodium hydrogenosulfite. Filtration through activated carbon is also effective.

ANNEX G

(*Foreword*)

GENERAL RULES RELATING TO SAFETY

G-1 RULES FOR SAFE HANDLING AND USE

The supplier shall provide current safety instructions.

G-2 EMERGENCY PROCEDURES

G-2.1 First Aid

G-2.1.1 *Contact with Skin*

a) Remove the product in excess,

b) Rinse immediately with cold water for 25 min, and

c) Remove the contaminated clothes.

G-2.1.2 *Contact with Eyes*

a) Rinse immediately with cold water for about 30 min with fountain; and

b) Seek medical advice immediately.

G-2.1.3 *Inhalation*

a) Place the affected person at rest away from the polluted area,

b) Place in reclining position, and

c) Seek medical advice immediately.

G-2.1.4 *Ingestion*

a) Gently clean the mouth with a clean linen,

b) Give large quantity of water to drink if the person is conscious,

c) Place the person in a safe position in case of loss of consciousness, and

d) Seek medical advice immediately.

G-2.2 Spillage

Collect and store in separate containers. Do not accumulate the spilled material and do not dispose of it via a rubbish bin or drains. Disposal shall be carried out in accordance with the local regulations.

G-2.3 Fire

The material is not combustible, but due to the formation of oxygen as decomposition by-product it will support combustion. Use air-independent respiratory equipment for the fighting. Use water to extinguish fire and to cool containers exposed to fire. Do not use dry chemical extinguishers containing ammonium compounds, for example, monoammonium phosphate.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. PCD 9 (2314).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *website* : www.bis.org.in

Regional Offices: Telephones

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002 — 2323 7617, 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi
KOLKATA 700054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 — 260 3843, 260 9285

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 — 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093 — 2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Simco Printing Press, Delhi